

MISSOURI resources

Fall 2011 • Volume 28 • Number 3

MISSOURI  STATE PARKS

director's comment



Missouri state parks and historic sites offer its visitors some of the greatest opportunities to get outdoors in nature and truly appreciate the beauty our state has to offer. Our state park system has a proud tradition of preserving and interpreting the state's most outstanding natural landscapes and cultural features while providing a diverse selection of recreational opportunities.

As Missourians, we play an important role in developing and maintaining the state park system heritage. It was the citizens of Missouri who encouraged legislators to establish a state park system back in 1917. The

to play a vital role in the system nearly 100 years later. Each year, parks and sites host informational meetings and open houses. The meetings are part of the department's ongoing effort to ensure the public has an opportunity to learn about accomplishments and discuss future plans for the facilities and services provided in state parks and historic sites.

Through public input, the park system has continued to improve to meet the needs of all Missourians and visitors to our state. Every year, more than 16 million visitors discover the beauty and history Missouri's state park system has to offer, creating a

Missouri legislature acknowledged the need for public recreation areas and passed the law establishing a state park fund that was managed by the Fish and Game Department.

The Department of Natural Resources took over the management of Missouri state parks and historic sites back in 1974 when the agency was created and share missions.

The public continues

more than \$700 million positive economic impact on the state and local communities. Missourians have continued to show their support for the park system through a dedicated parks-and-soils sales tax, first approved in 1984.

Missouri's state park system has a national reputation as one of the best in the country. We are truly blessed to contain some of the most outstanding state parks and historic sites that provide the public with more than 200,000 acres to discover, explore, learn and enjoy. Missouri's state park system offers something to suit everyone's taste – with 85 state parks and historic sites, the possibilities are boundless, so get outdoors and visit one today!

Sara Parker Pauley

Missouri Department of Natural Resources

MISSOURI resources

State of Missouri, Governor **Jeremiah W. (Jay) Nixon**

Department Director **Sara Parker Pauley**

Deputy Director, Policy **Dru Buntin**

Director, Division of Administrative Support **Lori Gordon**

Director, Division of Energy **Llona C. Weiss**

Director, Division of Environmental Quality **Leanne Tippet Mosby**

Director, Division of Geology and Land Survey **Joe Gillman**

Director, Division of State Parks **Bill Bryan**

Director, Environmental Improvement and Energy Resources Authority **Karen Massey**

Mission Statement

The mission of the Missouri Department of Natural Resources is to protect, preserve and enhance Missouri's natural, cultural and energy resources.

Fall 2011
Volume 28 • Number 3

Editor
Stuart Westmoreland

Design Director
Belinda Hughes

Photographer
Scott Myers

Public Information Coordinator
Andrew Richmond

Circulation
Luke Petree
Jessica Becklenberg

Editorial Board
Larry Archer
Hylan Beydler
Kerry Cordray
Dalena Hardy
Sue Holst
Stuart Westmoreland

MISSOURI RESOURCES is published three times per year by the Missouri Department of Natural Resources to inform readers about important natural resource issues and how they are being addressed. Any correspondence should be directed to the editor at the Department of Natural Resources, Publications, PO Box 176, Jefferson City, MO 65102-0176, or call 800-361-4827.

Email address: moresdnr@dnr.mo.gov
MoDNR home page: dnr.mo.gov
To subscribe or unsubscribe online:
dnr.mo.gov/magazine/subscription.htm

MISSOURI RESOURCES is available in alternative formats.

As a recipient of federal funds, the Department of Natural Resources cannot discriminate against anyone on the basis of race, color, national origin, religion, age, sex, disability, sexual orientation or veteran status.

If anyone believes he or she has been subjected to discrimination for any of these reasons, he or she may file a complaint with either the Department of Natural Resources or the Office of Equal Opportunity, U.S. Department of the Interior, Washington, D.C., 20240.

Missouri Resources is printed with soy ink on recycled paper at RR Donnelley, Liberty, Missouri.



printed on recycled paper



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

MISSOURI  **STATE PARKS**



2 Lighting the Way

by Kris Zapalac

Even with the advent of electric light in the late 19th century, architects continued to refine and employ the use of daylighting.

5 Civil War Sesquicentennial

by Tom Uhlenbrock

During the Civil War, Missouri soil saw more battles than all but two states – Virginia and Tennessee. These 1,200 distinct clashes claimed the lives of thousands of Missourians from both sides.

8 The Simple Joy of Sunshine

by Sue Holst

The Children in Nature Challenge aims to remedy a growing disorder among today's kids – “nature deficit disorder.”

10 Common Ground

by Beverley Kreul

As the State Parks Youth Corps efforts in Missouri State Parks wind down, the benefits from their first two years live on.

departments

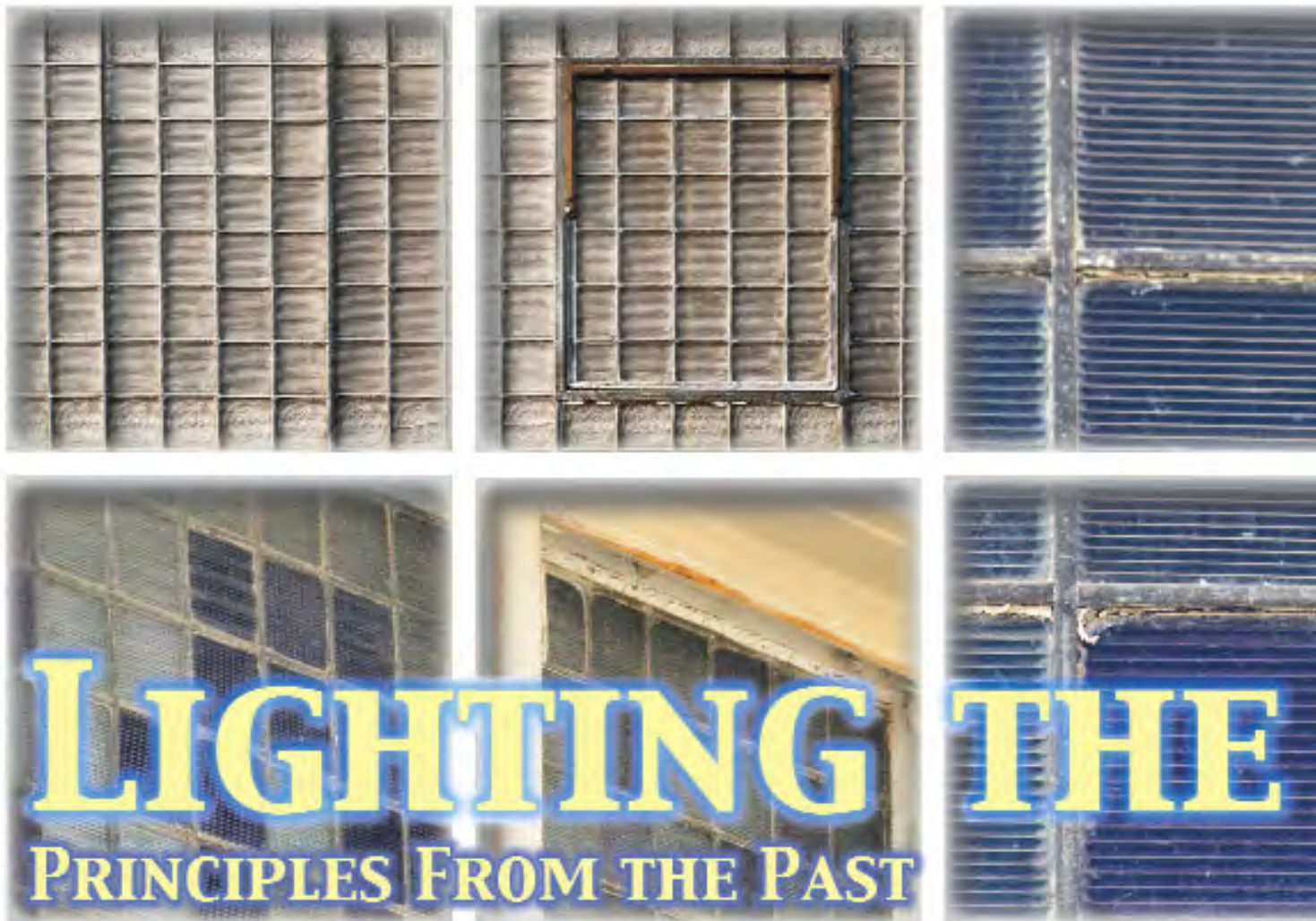
14 News Briefs 20 Resources to Explore 23 Career Connection 25 One Last Word

Above: The Milky Way rises over Stockton State Park in this panoramic view of the night sky.

Front Cover: Park visitors beat the extreme heat of summer 2011 at Rock Bridge Memorial State Park near Columbia.

Back Cover: Justin Davis, DNR geologist, pulls a rock core sample from the McCracken Rock Core Library in Rolla.

DNR photos by Scott Myers.



by Kris Zapalac photographs by Scott Myers

If you think the term “daylighting” is hot now, check out what was going on in the last decades of the 19th century. That is when the Merchants’ National Bank of Chicago let the sunshine in by using prismatic tiles and cut their electric bill by eliminating 250 incandescent bulbs.

It wasn’t just one bank in Chicago that was lighting the way. In 1897, architect Frank Lloyd Wright patented 41 designs for the new system using prismatic tiles. In 1899, Princeton University installed the same system. In 1903, stores in St. Louis and Kansas City announced their installation of prismatic tile systems.

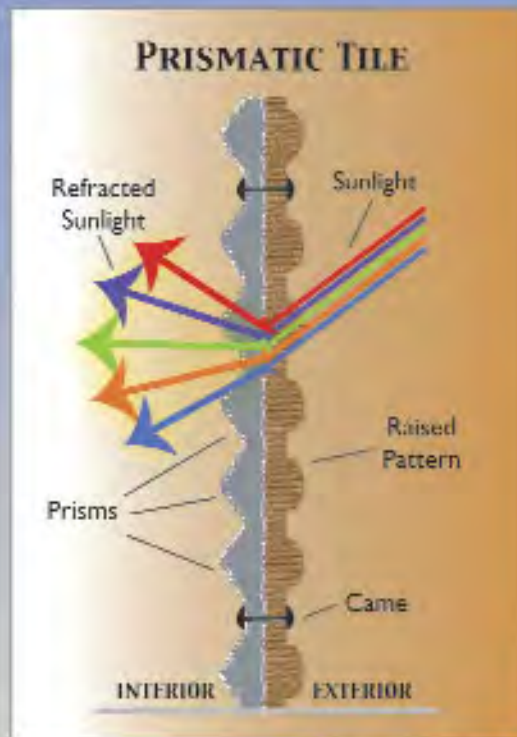
One of the leaders of the effort was James Pennycuick, who invented prismatic tiles and in 1897 founded the

Luxfer (light-bearing) Prism Co. Pennycuick’s invention took advantage of the laws of refraction. The horizontal prisms pressed into the interior side of the glass tiles diverted sunlight from its angle of incidence and threw the refracted light back into the room on parallel lines, uniformly lighting interior retail spaces. As stated in *The Age of Steel* in 1897, “No merchant would, of his own choice, sell cloth or garments by artificial light, and very few of the customers of the average retail clothing or dry goods store can trust their eyes as to cloth colors, except in the daytime and under fair daylight.”

Pennycuick had many predecessors. Perhaps the most notable was Thaddeus Hyatt, who in 1845 filed his first patent for vault or pavement

lights that illuminated dark basements built under the urban sidewalks. Hyatt employed angled glass set into iron or cement grids imbedded into the sidewalk. He moved to Kansas in 1856 as president of the anti-slavery National Kansas Committee. Hyatt used part of the fortune he had made from his inventions to assist John Brown’s abolitionist activities and his family after Brown’s execution.

Hyatt eventually went to prison rather than answer the U.S. Senate’s questions about Brown’s activities. He and his novel lighting product survived the Civil War that was soon to follow. In 1868, Hyatt’s vault lights were used in the new building for the Philadelphia Ledger. In 1890, his vault lights also were installed during



This graphic, adapted from a National Park Service drawing, illustrates the refractive benefits of prismatic glass, as shown at far left and in the close-up photo below. The diffused, natural light provided uniform lighting to interior spaces that were often poorly or inconsistently lit. The came were often made of zinc or lead to hold the tiles in place – similar to a stained-glass window.



the rehabilitation of the United States Mint at Philadelphia.

Hyatt outlived Pennycuik by four years, but it was nevertheless Pennycuik's Luxfer prism that was described in 1900 as "the century's triumph in lighting" in the pages of the *Inland Architect*. In 1904, more than half the New York subways utilized Luxfer Prism vault lights as part of their lighting scheme. In 1906, it was the installation of Luxfer's competitor, American 3-Way Prism glass, that enabled the Pennsylvania Railroad to outdo the Chicago bank by eliminating some 300 incandescent lights at Philadelphia's Broad Street Station. Approximately 100,000 square feet of American 3-Way's skylights were installed in the train shed roof at Kansas

City's Union Station in 1914 – at that time, the largest skylight and vault light installation in the United States.

In 1926, Luxfer and American 3-Way merged to form American 3-Way Luxfer Prism Co. By the end of the 1930s, inexpensive electricity and the rise of structural glass blocks had brought an end to an era, particularly in cities where commerce was a matter of constant competition. The rise of petroleum energy and advances in electricity reduced the interest in passive-energy technologies and soon, some prism glass was replaced with plate glass or hidden behind awnings.

The tide appears to be turning, however. The chart at right shows statistics gathered from the U.S. Depart-

Average Annual Energy Consumption for Commercial Buildings (non-malls)

Date constructed	Btu/sq. ft.
< 1920	80,127
1920-1945	90,234
1946-1959	80,198
1960-1969	90,976
1970-1979	94,968
1980-1989	100,077
1990-1999	88,834
2000-2003	79,703

According to DOE, the average annual energy consumption per square foot for the commercial buildings evaluated in 2006 was lowest for the buildings built from 2000 to 2003. The second most efficient commercial spaces were those built before 1920! The combination of the thermal mass (masonry construction), operable windows, building maintenance and rehabbing over the years allows them to compete very well with more recent buildings.



ment of Energy for energy consumption for non-mall commercial buildings surveyed in 2006.

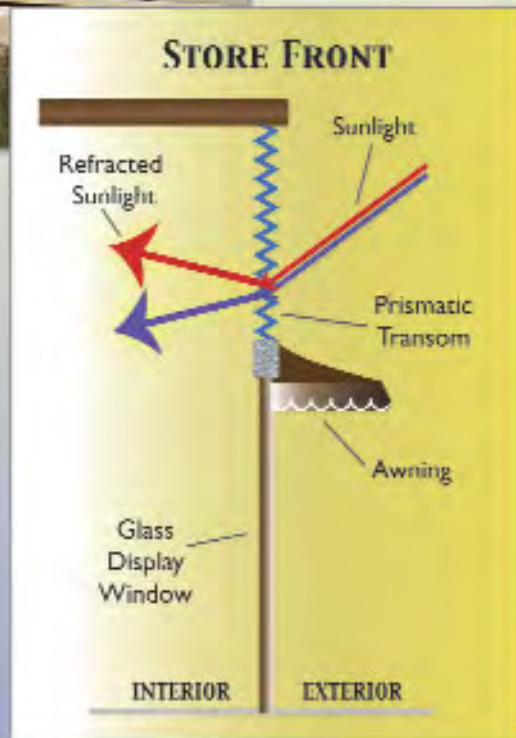
Those statistics are a surprise to historic preservation consultant Debbie Sheals from Columbia, who has assisted property owners with plans for historic rehabilitation projects in dozens of Missouri communities.

“When you think about it, it is logical that buildings erected before the advent of cheap energy would be designed to operate efficiently and especially to maximize available light,” Sheals said. “I’ve had several clients that have uncovered prism glass transoms simply to restore historic character, only to find that they also offer an extremely efficient way to add natural light to commercial spaces,” she said.

The next time you are in search of daylighting and energy efficiencies, stroll down the main street of one these communities where examples remain (see sidebar, bottom of page). Check out the transoms and even the sidewalks for some of the most brilliant ideas around.

For more information, search the terms “prismatic” and “glazing,” or visit the Lighting Research Center at the nation’s oldest technical university, Rensselaer Polytechnic, which is slightly older than the first U.S. patent for daylighting at: www.lrc.rpi.edu/programs/futures/lf-daylighting. Another option is the website for the Solar Heating and Cooling Programme of the International Energy Agency at: iea-shc.org/task21/publications/source/daylighting-c4.pdf – where the daylighting of the future involves prism glass and prismatic awnings. ☀

Kris Zapalac, PhD., is a historian and architectural reviewer for the Division of State Parks’ State Historic Preservation Office.



(Top) The former Bank of Bonnots Mill is a good example – as depicted by the graphic – of the use of prismatic glass transoms employed in store fronts in the late 19th and throughout much of the 20th century.

You can find prism glass in the transoms of shops and garages across the state. The list below includes some Missouri buildings that have been rehabilitated and some that have not. Some are retail establishments open to the public and some are not. All can be admired from the sidewalk.

- **FORMER BANK OF BONNOTS MILL,**
107 Main St., Bonnots Mill
- **GARAGE,** 311 E. Olive, Springfield
- **NEOSHO GIFTS, ETC.,**
114 S. Wood St., Neosho
- **GROTTO,** 127 E. Main St., Neosho
- **812 E. BROADWAY,** Columbia
- **212 GEORGIA,** Louisiana
- **123 N. MAIN ST.,** Cape Girardeau
- **302-04 BROADWAY,** Hannibal
- **412 S. OHIO AVE.,** Sedalia
- **CLAY COUNTY HISTORICAL MUSEUM,** 14 N. Main St., Liberty
- **1600-1602 GRAND BLVD.,**
Kansas City
- **104 S. MAIN ST.,** St. Charles
- **JOPLIN SUPPLY CO. BLDG.,**
228 S. Joplin Ave., Joplin

CIVIL WAR SESQUICENTENNIAL

MISSOURI SOIL CONFLICTED IN SACRIFICE



by Tom Uhlenbrock
photographs by Scott Myers



Missouri will mark its important role in the Civil War with a series of signature events held throughout the state during the sesquicentennial commemoration of the war's start 150 years ago.

Only two states, Virginia and Tennessee, experienced more battles on their soil than Missouri. Many of the earliest skirmishes that led up to the war were in the "Border War" between Missouri and Kansas.

"Our mission is to acknowledge the significance of Missouri in the Civil War to educate not only our children, but all the citizens of the state," said Kent Emison, co-chairman of the Civil War Sesquicentennial Commission.

"Whether Union, or Confederate, or African-American, the sacrifices were great on all sides," Emison said. "We will have a traveling display available at certain signature events over the next several years that will appropriately get that message across."

The two major events in 2011, Emison said, were the large-scale re-enactment on Aug. 12-14 at Wilson's Creek National Battlefield near Springfield, and a re-enactment scheduled for Sept. 17-18 near Battle of Lexington State Historic Site.

Emison was a natural choice for the commission, established by Gov. Jay Nixon. He lives in Higginsville, near the Confederate Memorial State Historic Site, and his law

Union re-enactors return to camp following their successful engagement with the Missouri State Guard at the re-enactment of the 1861 Battle of Boonville.



Approximately 500 Civil War re-enactors and over 10,000 spectators gathered on a rural farm in Cooper County to re-enact the June 17, 1861, Battle of Boonville. While small in comparison to other battles, it was the first land skirmish of the war and holds great significance in the history of Missouri and the Civil War.

Major Civil War Sites in Missouri

Wilson's Creek National Battlefield at Republic: The fight in August of 1861 was one of the first major Civil War battles west of the Mississippi. Union Gen. Nathaniel Lyon led 6,000 soldiers against Maj. Gen. Sterling Price, who had assembled some 12,000 men. The Southerners claimed victory. Lyon was fatally wounded, becoming the first Union general to die in the war.

Today, a self-guided driving tour winds through the 1,900 acres of fields and forest. The battlefield has a visitor center with a 30-minute introductory film, and a museum building with 6,000 artifacts. The National Park Service has restored the home of farmer John Ray, who watched from his porch as fighting raged in his cornfield.

Battle of Lexington State Historic Site

Lexington, located in northwest Missouri, was the site in September 1861 of what became known as the Battle of the Hemp Bales. Members of the pro-southern state guard used rolling hemp bales to advance upon and defeat Union forces.

The historic site has an interpretative center that explains the battle, and features the stately Oliver Anderson house, which changed hands three times during the first day of the three-day fight. Holes in the brick exterior and in the interior woodwork and plaster walls show where the house was struck by musket shots and cannon fire.

Confederate Memorial State Historic Site

Located a few miles southwest of Lexington, in Higginsville, a small white chapel and a field of some 800 modest tombstones mark where the Confederate Soldiers Home

office is in Lexington, near the Battle of Lexington State Historic Site.

"Our office building has a lot of history to it, we re-did the building and it has Civil War artifacts," Emison said. "We're near the oldest courthouse west of the Mississippi, which has a cannonball lodged in it."

The commission has set up a website at: mocivilwar150.com that gives a history of the Civil War in Missouri, and lists locations of prominent sites and markers throughout the state, as well as a schedule of events.





The routing of the poorly trained and equipped State Guard by Union forces kept the Missouri River and the state in Union control. It also prevented the pro-Confederate governor, Claiborne F. Jackson, from bringing Missouri into the Confederacy.

of Missouri was established with private funds in 1891. The home welcomed some 1,600 of the Confederacy's destitute soldiers and their families. The U.S. flag flew over the complex of buildings, but the caskets of the soldiers were draped in Rebel colors at their burials.

Most of the buildings are now gone, but the cemetery contains the marker of Johnny Graves, who was the last surviving Missouri Confederate soldier when he died in 1950 at the age of 108. Remains of William Quantrill, the Confederate bushwhacker, also are buried here.

Battle of Carthage State Historic Site

Visitors should stop first at the free Civil War Museum near the town square in Carthage, which vividly tells the story of the battle with artifacts and a diorama. Col. Franz Sigel and his 1,100 Union soldiers engaged the much larger pro-southern force of former Missouri Gov. Claiborne Jackson.

A large mural in the museum shows the running battle that went through Carthage. The historic site is a park-like setting near a spring where both sides camped in July 1861 before and after one of the earliest engagements of the Civil War.

Fort Davidson State Historic Site

Located in the scenic Arcadia Valley of southeast Missouri, the hexagonal earth-

work fort was the prize in one of the most important, and dramatic, of Missouri's battles. A diorama in the visitor center explains how the out-manned Union forces out-foxed Maj. Gen. Sterling Price and his more than 12,000 troops.

The Union forces fled the fort under the cover of darkness, and then blew up the powder magazine to destroy any supplies. Price had up to 1,000 men dead or wounded, and gave up on his goal of capturing St. Louis or Jefferson City.

Battle of Athens State Historic Site

In August 1861, some 500 men under Home Guard Col. David Moore used muskets commandeered from a freight train to repel Col. Martin Green's pro-Southern state guard forces of about 2,000 men. They were fighting for control of Athens, which was a thriving town of some 50 businesses and 600 people.

The 406-acre historic site is a serene, wooded setting near the Des Moines River in the northeast corner of Missouri. Athens now has only a handful of residents. The remaining historic buildings include the Thome-Benning Mansion, which was pierced by a cannonball during that summer's Battle of Athens. 🌅

Tom Uhlenbrock is a writer for the department's Division of State Parks.



THE SIMPLE JOY OF SUNSHINE

Children in Nature Challenge

by Sue Holst



Photo by Tiffany Bayer



DNR photo by Scott Myers

(Top) Missouri first lady Georganne Nixon is leading the Children in Nature Challenge to encourage communities, families and children to discover the simple joys of being outside in nature. **(Above)** Providing this opportunity at an early age often leads to a lifetime of exploring and appreciating the outdoors.

The next time your child feels anxious or upset, perhaps the best medicine you can prescribe is an afternoon in the great outdoors.

For many of today's adults, childhood memories of summer days were exploring a nearby creek or camping under the stars with their families. For today's children, fun may mean sitting in front of the television or computer playing video games. Many of today's kids have not discovered the joy of exploring the outdoors and may suffer from what some have referred to as "nature deficit disorder."

Research has shown that as a result of nature deficit disorder, children face an increasing number of health, behavior, academic and quality of life problems.

The most obvious symptom may be obesity but this disconnect with nature may also lead to anxiety and learning disabilities. The challenge is finding ways to connect kids with the outdoors and letting them discover for themselves the simple joys of exploring the natural world. To achieve this, they must have the tools, resources, opportunities and encouragement to take that first step into the outdoors.

To lead this challenge, Gov. Jay Nixon signed an executive order in early 2010 establishing the Children in Nature Challenge. The program recognizes communities and families who create opportunities for their children to get outside and discover the joys of nature firsthand.

"We know that children benefit physically, mentally and even spiritually by connecting with nature," said first lady Georganne Nixon, who is leading the challenge. "Nature makes kids happier and healthier and it is our responsibility to make sure

they have that opportunity,” she said. To implement the challenge, the executive order established a committee of agencies with Missouri State Parks and the Missouri Department of Conservation leading the effort. The effort reaches out to communities to make them aware of the issues and provide them with resources that will help them meet the challenge.

To successfully complete the challenge, a community must meet several criteria, including increasing awareness of the opportunities to connect to nature; providing activities and events for children; enhancing and creating areas for children to connect to nature; encouraging the use of nature-based curricula in schools; and partnering with local organizations and businesses to connect children with nature.

In April, the first lady recognized Springfield as the first community in Missouri to achieve the Children in Nature Challenge. Other towns have joined the effort as awareness of the program has begun to grow.

A second part of the challenge is for families. Like many successful programs, the most important effort must begin at home. Children learn by example, so parents who love the outdoors are more likely to encourage their children to experience nature. For parents not familiar with the outdoors, this challenge may be the incentive to discover a new world outside their home. By doing so, they also can become certified as a Children in Nature Challenge Family.

One of the directives from the executive order was to encourage agencies to make the public aware of resources available to reconnect to nature. One agency that has been providing these resources for more than 90 years is Missouri State Parks. With 85 state parks and historic sites, the state park system has endless opportunities for hiking, camping, picnicking, boating, fishing or simply being outside and taking in nature all around you.

“You may have heard people talk about the last child in the woods. Our effort is to get every last child in the woods and make sure they can experience the joys of catching their first fish or eating s’mores around a campfire,” said Bill Bryan, Missouri State Parks director.

To help encourage these experiences, additional events and programs are being developed in state parks for children and



DNR photo by Scott Myers

young adults. Programs such as the WOW National Outdoor Recreation and Conservation School showcase the outdoors with classes such as how to fish or set up a tent for the first time. Other programs feature smaller wonders of nature such as the flight of a bird or which flowers grow in spring.

“The success of the Children in Nature Challenge will be measured one child at a time,” Bryan said. For one child, Cameron Christgen, a fifth grader from Rushville, the success came at an event at Weston Bend State Park with the realization that, “I like being outside because it is really fun.” The challenge is to spread that fun to all children in Missouri.

For more information, go to: childreninnature.mo.gov. For information on Missouri state parks and historic sites, visit: mostateparks.com. 🌅

Sue Holst is the information officer for Missouri State Parks, a division of the Department of Natural Resources.

(Top) Interpreters in Missouri State Parks provide programs and activities designed to stimulate children’s interest and appreciation in animals and plants. Theresa Ramsey, right, from Knob Noster State Park, presented one of these programs at the annual WOW National Outdoor Recreation and Conservation School in Kansas City.

(Bottom) Research confirms the benefit of unstructured time for children to discover the small things about nature that fascinate them.



DNR photo by Scott Myers

STATE PARKS Year COMMON

by Beverley Kreul

Hannah Cavanagh and Austin Redd have little in common. Cavanagh was originally from Moscow, Russia, home to more than 11 million people, before coming to America. Redd has lived in Missouri his entire life and grew up in the small town of Philadelphia in northeast Missouri.

He has worked most of his life on the family farm raising hogs and cattle.

Born during the period of the collapse of the Soviet Union, Cavanagh was raised in an orphanage. The severe economic conditions of the early 1990s made it impossible for her parents to care for her, and she was soon adopted by an American family. She hopes to repay this blessing by someday working with Red Cross disaster relief efforts in the United States.

Cavanagh spent most of her youth working in various restaurants bussing tables and being a hostess. She also held down a few odd jobs at the local mall while in high school. What the two teens do share is a love of the outdoors and a strong work ethic – and a struggle to find a summer job.

The current job market is tough on everyone, but this recession has become a jobs disaster for youth workers. A study done at the Center for Labor Market Studies at Northeastern University found that proportionally, more teens have lost jobs in the past few years than the entire populace lost in the Great Depression of the 1920s. This is a trend the State Parks Youth Corps is looking to change.



YOUTH CORPS

Two

GROUND

photographs by Scott Myers

The SPYC is a program initiated by Gov. Jay Nixon in spring 2010. The effort is a cooperative partnership between the Division of Workforce Development and Missouri State Parks. Missouri youth ages 17 to 21 are eligible to participate in the program allowing them to gain valuable work experience and enhance personal development. In the program's pilot year, more than 1,000 young Missourians were employed through the program. Youth corps members do everything from maintenance work to guiding tours to social media work.

"The State Parks Youth Corps allowed us to do lots of good work for all of our state parks and historic sites," said Bill Bryan, director of Missouri State Parks. "They used more than 2,000 gallons of paint, signed and blazed 650 miles of trails and re-roofed more than 20 buildings. They also produced videos, assisted in archaeological digs and interpreted exhibits for visitors."

This year, Redd began working at the Bothwell Lodge State Historic Site in Sedalia. In the first few weeks, he learned skills in construction and lawn care and gained valuable work experience that future employers insist upon seeing in a resume.

"I've never done flooring or framing and hanging walls, so I've been enjoying this a lot," Redd said. "I have only done [roofing] once or twice so I'm getting more experience doing that and that is always a good thing to know how to do."



(Opposite page) Hannah Cavanagh, Osage Beach, is one of more than 30 youths who spent their summer working at Lake of the Ozarks State Park through the State Parks Youth Corps program.

(Above) Amanda Cope, a native of St. Louis, spent part of her summer working at Lake of the Ozarks State Park. She was in charge of maintaining the boat trails at the park, as well as landscaping and cleaning common areas.



Daniel Mullins, Savannah, stands on a newly repaired dock on the Lake of the Ozarks. State Parks Youth Corps workers maintain the park amenities for the safety and convenience of visitors.

Not only is he grateful for the experience of working with the State Parks Youth Corps, Redd also appreciates the natural setting and fresh air.

While the work lacks a glamorous lifestyle and an air-conditioned office in most cases, it does have something other jobs don't often provide – a chance to work in the great outdoors. Cavanagh echoes those benefits of nature.

"I enjoy being able to work outdoors," Cavanagh said. "It makes you feel open, I think. I lost touch with most people after graduation so this is also a good way for me to make new friends."

Cavanagh works through the program at Lake of the Ozarks State Park. Her primary responsibilities are cleaning common areas, lawn care, trail maintenance, fence repair, painting and various other jobs around the parks grounds.

With the job being anything but routine, there is rarely a monotonous day. This is one of the best aspects of the position, according to Spencer Preece, another SPYC worker and lifelong resident of nearby Camdenton, who worked during the summer at Ha Ha Tonka State Park.

"I was told it was a friendly environment and that we were going to be outside the whole time and we get to do a whole bunch of different projects," Preece said. "I figured I have been coming here my whole life, so it was a chance to give back for what I have been able to enjoy."

Giving back was one benefit Stuart Becker, a SPYC supervisor at the Lake of the Ozarks State Park, did not expect. When he was hired to supervise the youth, he was a bit skeptical. But, instead of finding the lazy, sleepy and unmotivated stereotype of young people of today, Becker discovered why SPYC workers are recognized as some of the hardest working youth in the state of Missouri. This self-described country boy sees the SPYC as a way for him to contribute to the next generation.

"I have found that the youth working with me are certainly participating and willing to learn. I have been tickled to death to try to teach them some of the skills that I have," Becker said. "I was born and raised with a hammer and saw in my hands, so this is all second nature for me. My dad taught me and so if I can help teach some other kids it works out great."

With his fatherly attitude and the patience of Job, Becker has trained his SPYC charges with job skills that are often overlooked. The rewards are significant for the youth and supervisors, but the parks system has benefited most. Larry Webb, a park naturalist at Ha Ha Tonka State Park, has only seen good things come from youth working in the park.

"It gives us a lot of extra hands. And, with those extra hands come some good personalities. We are able to accomplish a lot more," Webb said. "We get a lot of questions from park visitors about SPYC and most people we talk to tend to think it's a really good idea."

(Below left) SPYC workers learn and have a variety of skills that they can share with coworkers. Brad Ponder of Eugene works with power tools and heavier equipment to gain valuable work experience and training during his time in Missouri state parks.

(Below right) Maintaining park buildings is a major responsibility for SPYC workers. Clifford Ogle, Richland, applies a fresh coat of paint to one of the many public structures that are found at Lake of the Ozarks area parks.



“It gives us a lot of extra hands. And, with those extra hands come some good personalities. We are able to accomplish a lot more.” – Larry Webb, park naturalist, Ha Ha Tonka State Park

The State Parks Youth Corp is a silver lining in the current job situation for all involved in the program. Youth are able to gain job skills and employment opportunities as well as spend time in many of Missouri’s great state parks. Supervisors like Becker have found a way to give back to the community and instill in the next generation some of the lessons he learned as a kid. The parks system is able to accomplish large-scale projects and make parks more enjoyable for all visitors through the youth corps.

While all of the stakeholders in the program have different goals, desires and backgrounds, they are able to find common ground in making Missouri’s state parks the best they can be. 🌅

Beverley Kreul is a senior at the University of Missouri and is studying agricultural journalism. She is a communications/multimedia intern for the Missouri Department of Natural Resources through November 2011.

New State Park Apps



It is now easier to access information about Missouri state parks and historic sites. A new free mobile application, available for the Apple iPhone and Android smart phone, has innovative features that are sure to enhance any visit to a Missouri state park or historic site. The Pocket Ranger™ Mobile Tour Guide enables you to find a state park by location or activity.

Features include a trail menu to locate available trails for different types of use; a direct link to the park's reservation site so you can make arrangements for overnight stays; and access to useful information such as weather alerts, operational times and park events. With the social networking feature, you can snap a photo and share it with family and friends.

Additional features are available by upgrading to the Pro version of the software, with a portion of these profits going to Missouri State Parks. Features on the Pro version let you record trails and waypoints during an outdoor trip, keep track of where your family and friends are in the park, and notify contacts in an emergency.

The Pocket Ranger™ Mobile Tour Guide can be downloaded from the iTunes Store and Android Market, or directly at StateParkApps.com. Download your Official Guide for Missouri State Parks & Historic Sites today.

Take Part in Earth Science Week 2011

"Our Ever-Changing Earth," – the theme of Earth Science Week 2011 – will engage young people and the public in learning about the natural processes that shape our planet over time.

During Earth Science Week, Oct. 9-15, the Department of Natural Resources will partner with the American Geological Institute and others to also remind people that Earth science is all around us, to encourage Earth stew-



ardship through understanding, and to motivate geoscientists to share their knowledge and enthusiasm about the Earth.

Three national contests are slated for Earth Science Week: photography, visual arts, and essay. The contests will allow students and the public to learn about earth science and compete for prizes.

Additionally, the department will mark the 2nd Annual National Fossil Day on Wednesday, Oct. 12, with special exhibits in the Ed Clark Museum of Missouri Geology, located at the Division of Geology and Land Survey building at 111 Fairgrounds Road, Rolla. For more information about Earth Science Week, National Fossil Day and ways to become involved visit: dnr.mo.gov/geology/.

Awards Recognize Missouri State Parks

The public recognizes state parks as an award-winning place to explore Missouri and have a great experience. Several recent awards also recognize the Missouri state park system for its other benefits and strengths. Readers of AAA Midwest Traveler magazine voted Katy Trail State Park as the best bicycling trail in the Midwest.

The award indicated that the Katy Trail would "certainly be earning straight A's ... in nearly every trail characteristic." The trail, the longest-developed rail-trail project in the nation, stretches 240 miles from Clinton to Machens and attracts more than 300,000 people annually.

Partners for Progress of Greater St. Charles recognized Katy Trail State Park for its role in making communities quality places to live with its 2011 Quality of Place Progress Award. Partners for Progress, founded by the Economic Development Center of St. Charles County, recognizes individuals, businesses and local entities that contribute to making the community an appealing place to work and play.



The national Coalition for Recreational Trails recognized the White River Valley Trail in Table Rock State Park with its 2011 award in the Multi-Use Management and Corridor Sharing Category. The coalition presents the awards to projects that make outstanding use of federal Recreational Trails Program funds.

The trail, a 10.25-mile natural surface trail, is the first designated mountain biking trail system in the area and opened to the public in the summer of 2011. The National Association of Recreation Resource Planners awarded Missouri State Parks with an Excellence in Planning Award for its planning effort involved in rebuilding Johnson's Shut-Ins State Park after the reservoir breach of 2005.

The park fully reopened to the public in 2010.

Grant Awarded to Division of Geology and Land Survey

The U.S. Geological Survey recently awarded a STATEMAP grant in the amount of \$121,739 to the department's Division of Geology and Land Survey as ongoing support to advance detailed geologic mapping in the St. Louis area.

Since 1993, the department has been actively involved in the USGS National Cooperative Geologic Mapping Program and has produced 102 bedrock and 95 surficial material geologic maps for locations across the state. Geologists will coordinate supporting data from the Missouri Department of Transportation and the Department of Geological Sciences and Engineering at the Missouri University of Science & Technology.

Bedrock and surficial material geologic mapping in Missouri is needed to establish the geologic framework of areas determined to be vital to the economic, social and environmental well-being of the state.

Learn more about STATEMAP at: dnr.mo.gov/geology/statemap/statemap.htm.



Consumers Urged to Learn About Their Drinking Water



Do you know what is in your drinking water? If not, the Missouri Department of Natural Resources is urging consumers to find out more about their drinking water quality by reviewing a report from their local water system.

Public water suppliers were required to make the Consumer Confidence Reports available to their customers by July 1. The reports describe the water sources used by the systems and identify any contaminants found during routine drinking water testing. The reports also inform consumers of the water system's compliance with other drinking-water-related rules and provide general information about drinking water and health.

The Consumer Confidence Reports also provide suppliers with an opportunity to explain how they protect the community's drinking water supplies in order to build their relationship with the customer. The department encourages the public to read their water system's Consumer Confidence Report and become better informed about their drinking water.

Any citizen served by a community water system who has not received a Consumer Confidence Report should call their local water provider and request a copy.

Boone County Receives \$438,000 for Sewer Upgrades

The Missouri Department of Natural Resources has awarded Boone County Regional Sewer District a \$438,000 low-interest loan to eliminate two wastewater treatment plants and construct a new collection system.

The district will use the proceeds to properly abandon the Arrowhead Lake Estates treatment plant and University Estates lagoon. The district will construct a force main and gravity line to



environmental notes

Camping, Science ... and Kids!

How would a middle school student envision an amazing environmental experience? A great way to find out is by attending a DNR Science Camp. In May 2011, the Department of Natural Resources completed six pilot camps with Lange Middle School from Columbia. Held at the Mark Twain State Park Si Colburn Group Camp near Florida, Mo., the three-day, two-night excursion featured presentations put on by DNR employees who work every day to preserve and protect Missouri's air, land, water and natural and historic parks and sites.



Photo by Debbie Brunner

Campers learned how to properly sort recyclables at the first DNR Science Camp.

Students were invited to give back to their state park through service-learning projects funded by the Department of Elementary and Secondary Education. The youth campers provided over 335 hours of service to the campground – to the future benefit of all state park visitors.

Over 50 teachers and administrators from Lange Middle School came to the DNR Science Camps and pitched in as counselors for the students. They noted

some benefits they hadn't expected, as well as a better understanding of some kids whose enthusiasm wasn't always showing up in the traditional classroom setting.

"I have a ... student who had never been camping and was complaining about being 'forced to go,' before the trip," said April Brown, a 7th grade social studies teacher. "The last day of the trip we watched a slide show of pictures from the (science camp) and as it ended she leaned over and asked, 'Ms. Brown, when can we come back?' My assistant principal

and I both choked back tears. It was very touching to see that she had thought of this as such a positive experience!"

For more information, please contact the Education Coordinator for DNR at: education@dnr.mo.gov.



Photo by Cheri Gaulbert

Exploring Mark Twain Birthplace State Historic Site was a camp highlight.

connect both subdivisions to the city of Columbia's wastewater treatment plant. Loan funding comes from the Clean Water State Revolving Fund.

The fund is a joint effort between the department and the U.S. Environ-

mental Protection Agency to provide cost-effective financing for clean water infrastructure improvements. DNR's Water Protection Program will administer the loan funds. The department is committed to working closely with

public entities to assist with funding efforts that support clean water infrastructure improvement projects, as well as provide a financial savings.

For more information, contact the Water Protection Program, PO Box 176, Jefferson City, Mo. 65102-0176, call 800-361-4827 or 573-751-1192, or visit DNR's website at dnr.mo.gov/env/wpp/srf.

Marston Welcome Center Dedicated on I-55

The Missouri Department of Transportation held a ribbon cutting ceremony May 24, 2011, to celebrate the completion of the Marston Welcome Center. The center, located at south-bound Interstate 55 mile marker 42.4, in New Madrid County, highlights the

great New Madrid earthquakes of 1811-12 and the region's rich history.

Jerry Prewett, Geological Survey Program director, Missouri Department of Natural Resources, Division of Geology and Land Survey, and other invited guests spoke during the ribbon-cutting ceremony.

This is the bicentennial anniversary of the 1811-12 earthquakes. Several of

We are students from the Center for Creative Learning in Rockwood. The CCL is a gifted program in the Rockwood School District in the St. Louis County area. We just saw the clean air articles in *Missouri Resources* and wanted to share what we have been doing for the idling problem. We have just finished our final project for the semester which was an anti-idling campaign, called Action4Air.

We partnered with Susannah Fuchs and the St. Louis Regional Clean Air Partnership. We then developed a mission statement. All 50 students from across the school district were divided into four groups: message, sign, parent pick-up and the design groups. Most of our work can be seen on the idling webpage we developed at: staff.rockwood.k12.mo.us/nuetzelkathy/Pages/Idling.aspx.

We are placing permanent signs in our parking lot and created a documentary video. We also designed and sold T-shirts promoting our anti-idling message.

We enjoyed the clean air articles, and are excited about working together toward cleaner air in Missouri!

Caroline, Katie, Fatou, Christian, Jenna, Justin, Connor, Abi, Susie, and Caileigh (Wednesday class)

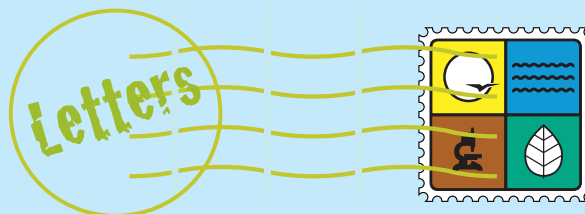
Kathy Nuetzel
CCL Program educator
Rockwood School District

Editor's Note:

On their website, the closing slogan, also created by one of the students, reads: "Keep Your Idling Snappy & Keep the Air Happy." Nuetzel's groups come from 19 different elementary schools in the district, meeting for one semester. Each semester, the new incoming students plan to build upon the existing Action4Air campaign.

Your article on idle-free zones was great. I always cringe when I go to basketball games and we walk by two buses that idle for three hours during the games! It makes me wonder whether there are ways to assist or educate the trucking and travel industries in order to reduce idling tractor-trailers at rest stops, or tour buses as they await their passengers at restaurant or other sites they visit.

While visiting Germany in 2003, our bus driver had to turn



off the motor after 10 minutes (no air conditioning after that). He said it was the law in Germany – buses and trucks can idle only 10 minutes maximum. I know this means no A/C or heat for the riders. How can this be solved in the U.S.?

Betty Landre
Cape Girardeau

Editor's Note:

According to our Air Pollution Control Program, great strides have been made in this area, thanks to funding from the Diesel Emission Reduction Act. One solution has been retrofitting school buses with fuel-operated heaters. These units are capable of providing heat without the engine running. This technology has been installed on hundreds of Missouri school buses, although it does not address air conditioning.

If you see buses idling for extended periods of time, inquire what the school district or college's idling policy is – or if, in fact, they have one. Many schools have adopted idling limits on their buses. You can see what your local public schools are doing by visiting our Missouri School Bus Inventory website at: bit.ly/bussurvey. If there isn't an idle reduction policy, ask if they would consider adopting one. Examples are posted on the web page above at: bit.ly/dnrdera.

The Darker side of Ozone? Really? So, I filled up my gas tank and apparently put ozone all over the place. Then, idling is killing my kids. Here's what I think would make us all breathe a little easier, a little reality check from you "brain police." I'm almost afraid to open up the next issue of *Missouri Resources* and read another series of "sky is falling" stories.

Jack Brown
Camdenton

Letters intended for publication should be addressed to "Letters," *Missouri Resources*, PO Box 176, Jefferson City, MO 65102-0176 or faxed to (573) 522-6262, attention: "Letters." Please include your name, address and daytime phone number. Space may require us to edit your letter. You also can email *Missouri Resources* staff at moresdnr@dnr.mo.gov.

the largest earthquakes to strike the continental United States occurred in the winter of 1811-1812 along the New Madrid Seismic Zone, which stretches from just west of Memphis, Tenn. into southern Illinois. These quakes produced at least three temblors believed to have been magnitude 7 or larger, followed by hundreds of aftershocks.

For more information visit:
dnr.mo.gov/geology/geosrv/marstonwelcomecenter.htm.

Drinking Water Systems Fail to Test



The Missouri Department of Natural Resources has identified 21 drinking water systems in Missouri that have chronically failed to complete drinking water testing required to ensure a safe water supply.

The department classifies a drinking water system as a chronic violator when it has three major monitoring violations in a 12-month period. All public water systems are required to test for bacteria at least once a month to verify these systems are providing safe drinking water. The vast majority of community and non-community public water systems in Missouri comply with all monitoring requirements and meet all drinking water standards. The current list of 21 systems represents less than one percent of the approximately 2,800 public drinking water systems in Missouri.

Bacteriological testing can be the first step in identifying and correcting a problem. The next step is to investigate the cause of any bad samples and perform corrective action, such as disinfecting and flushing the system. When a public water system has a record of both failing to monitor and a history of exceeding contaminant levels, this may raise concerns about the quality of the drinking water.

To view details on the violating systems, visit DNR's website at dnr.mo.gov/env/wpp/chronic/index.html.

Stream Team Notebook

Arnold Stream Team – the “Mighty 211”

If you spend much time talking to Stream Team folks, the talk usually comes around to the Arnold Stream Team #211. After 20 years of activity, the Arnold Stream Team has plenty of tall tales to tell. At least they sound like tall tales until you meet Bernie Arnold and Brian Waldrop, the current leaders of the “Mighty 211.” Then you find out how real those stories are.

Started in February 1991 by Mike DeRuntz, the Arnold team has grown to over 500 official members and many more unofficial members in its 20 years of activity.

“When we hold a clean-up in Arnold, the whole community turns out. The City of Arnold sends trucks and workers to help haul away litter and for the summer clean-up the local restaurants donate food for everyone,” said Laurie Ferretti, a member of the team.

Waldrop and Arnold have river clean-ups down to a science. They know how many tires will fit into a trailer or a dumpster. Arnold believes the biggest problem they face is waste tire disposal.

“We pulled a little over 4,000 tires out of the Meramec last year and it is hard to find someone with a waste tire hauling permit to help us get them to the tire shredder,” said Arnold. He went on to say that he hopes the rules will loosen up a bit when the activity benefits a non-profit group.

“The question is not if we can get something out of the river,” said Waldrop. “The hard part is finding out what to do with it when we get it out. Nothing stops Bernie when he finds something that needs to be removed from the river. If he does not have the right equipment to do the job, he will go out and borrow or buy it.”

“We hold two big cleanups here in Arnold every year, but we do something to help the environment almost every day. If there is an opening on the Stream Team calendar, we try to fill it,” said Waldrop. “Stream Team is like a big family. Teams come here to help us, and we go there to help them- even as far away as Kansas City,” he added.

It seems that nothing is too big for the Mighty 211, so if you hear a tall tale about a couple of guys hauling an RV out of the river in a canoe, they are probably talking about Stream Team 211.



Brian Waldrop and Bernie Arnold

DNR photo by Susan Higgins

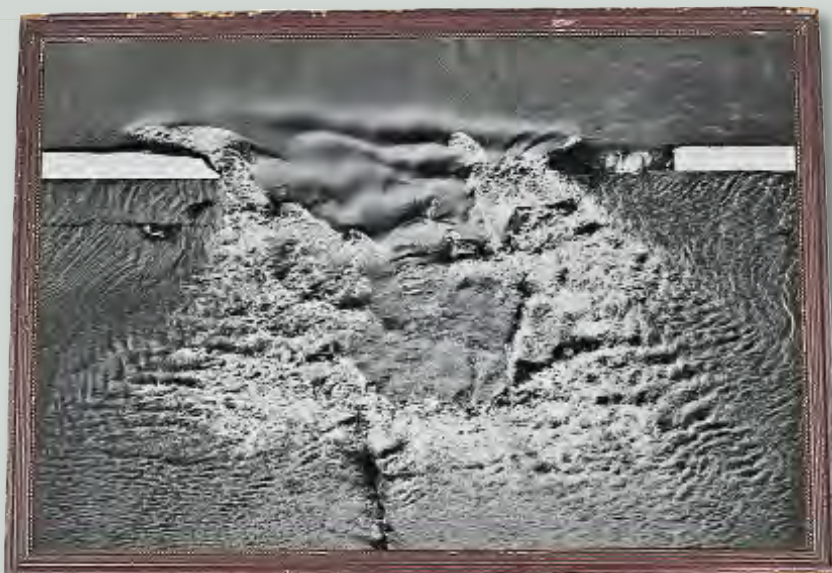


Hampton Feedlot Gets \$450,000 Biogas Grant

An animal feeding operation in Chariton County received a \$450,000 subgrant through the Energize Missouri Renewable Energy Biogas Grant

Program to assist in the installation of an anaerobic digester to renewable electricity system which uses cattle manure. The total project cost is nearly \$4 million. Anaerobic digesters have the power to transform organic food

TIME EXPOSURES



During the winter of 1937, the waters of the Mississippi River were nearly 60 feet high at the Bird's Point levee in the Missouri Bootheel. To protect the town of Cairo, Ill., population 13,000, the U.S. Army Corps of Engineers had designed Bird's Point to overtop and create crevices when a 55-foot flood stage was reached. When the flood stage failed to produce enough of a crevice to activate the floodway, dynamite was employed, as shown in this 1937 aerial photo. As a result, thousands of acres of Missouri farmland were flooded, 4,000 of which were rendered unfarmable. Thirty-five people lost their lives, 30 of which were flood workers who drowned when their barge sank. More than 12,000 others were displaced and moved to shelters.

Despite opposition, on May 2, 2011, the USACE once again blew up the levee in Bird's Point. Part of the New Madrid Floodway, the rebuilt levee was again designed to protect the town of Cairo. Not unlike in 1937, 130,000 acres of Missouri farmland were flooded and over 100 homes were damaged or destroyed. And once again, the city of Cairo and its residents – now 2,800 in number – were spared.

Photo from the American Memory Collection, Library of Congress.

Send your photo to "Time Exposures," c/o Missouri Resources, PO Box 176, Jefferson City, MO 65102-0176. Original photos will be returned via insured mail. Pre-1970 environmental and natural resource photos from Missouri will be considered. Please try to include the date and location of the picture, a brief description and any related historic details that might be of interest to our readers.

Wanted: Maps of Abandoned Underground Coal Mines

Thanks to the generosity of the State Historical Society, county historical societies and county recorders of deeds, state and national databases of abandoned underground coal mines are being expanded with invaluable historic maps.



Forty maps of abandoned underground coal mines have been loaned to the Missouri Department of Natural Resources, through its Division of Geology and Land Survey, for scanning and entering into these important abandoned mine databases.

In late 2010, the department received funding from the U.S. Department of Interior's Office of Surface Mining to investigate, collect and scan maps of underground coal mines. The federal agency collects and maintains mine map information and images for the entire country.

Staff geologists will be advancing the state's knowledge of past mining activities by collecting and archiving historic underground mine maps from across the state to develop a geospatial Web interface to serve mine maps to the public online. This effort will provide a better understanding of underground mining information to support safety and infrastructure development in Missouri.

If you have a map of an abandoned underground coal mine you are willing to loan, please contact the principal investigator for this grant, Cheryl Seeger, by calling 573-368-2100. Learn more at: youtube.com/watch?v=sfxUAcdiez8.

waste and manure into renewable energy. By harnessing biogas, these digesters transform waste into heat or electricity. This will provide Hampton Feedlot with additional electricity.

KCP&L Greater Missouri Operations will purchase the electricity produced by the digester. Electricity gen-

erated from animal waste is eligible for Proposition C, which requires investor-owned utilities to get 15 percent of their electricity from clean energy sources.

In March, DNR officials participated in the groundbreaking for the addition of the anaerobic digester.

For news releases on the Web, visit:
dnr.mo.gov/newsrel/index.html.

For a complete listing of the department's upcoming meetings, hearings and events, visit the department's online calendar at:
dnr.mo.gov/calendar/search.do.

Resource Honor Roll **Jon Beard**

For the past 41 years, Jonathan “Jon” Beard has enjoyed all of what Missouri’s caves have to offer. But when it comes to the frequent vandalism of the cave ecosystems that he loves, his passion is redirected.

“We have a choice – seeing a cave in its natural beauty or seeing a cave resembling a trash dump. Which do we prefer to see?” Beard said.

To him, the answer is obvious. For the past 28 years he has worked tirelessly to restore and protect vandalized caves all across the state of Missouri.

“I have been interested in caves since 1970; first as something different to photograph, but later to study and conserve,” said Beard. “As I visited more caves, I could see the chronic destruction that was left by vandals.”

In 1983 he helped install a cave gate in Breakdown Cave in Christian County. After witnessing the extreme vandalism in the cave, he began managing Breakdown Cave as a restoration laboratory and speleology classroom. In this setting, Beard developed techniques and materials to help repair the damage caused by vandals. He also tapped his employer, the 3M Company, for help with adhesives and other products in an effort to reattach broken speleothems and safely clean spray paint from cave walls.

“Because of techniques developed in Breakdown Cave, I and others have been restoring many other caves in Missouri and Arkansas, including the reattachment of 193 broken speleothems in Fisher Cave of Meramec State Park,” said Beard.

Not all of Beard’s hard work is done in a subterranean setting. He

chairs the Springfield Plateau Grotto of the National Speleological Society, a charitable organization. Beard also is vice president of the Missouri Caves & Karst Conservancy, another charitable group with a similar purpose.

“No cave is too dark, too low, too wet, or too scary for Jon, so cavers respect his abilities and his dedication,” said Jerry Vineyard, a former deputy state geologist and assistant director for DNR’s Division of Geology and Land Survey.

The recently completed mapping of Garrison cave No. 2 in Christian County, the longest cave in southwest Missouri, speaks to Beard’s dedication.

“It took 13 years, and it involved some of the most difficult caving – long, cold-water crawls, risk of flooding, extremely tight passages, very long trips, and the need for wetsuits,” said Vineyard. “But nothing stopped Jon. He kept at the task until he finished it.”

The hard work by Beard and his fellow cavers cannot be fully measured, and their restoration efforts continue statewide.

“Missouri contains one of the richest assortments of cave resources in the country, and they are all worth preserving,” said Beard.



Photo by Roy Gold

Jon Beard

Rock Matters

Limestone

Products derived from limestone are abundant in the homes in which we live, in the roads and bridges on which we drive, in the buildings in which we work, in the foods that we eat and in the purification of the water that we drink. DNR photos by Pat Mulvany (top) and Hylan Beydler (bottom)

A sedimentary rock, limestone is dominantly composed of calcium-bearing carbonate minerals calcite (CaCO_3) and dolomite ($\text{CaMg}(\text{CO}_3)_2$). The bulk of calcite in limestone is derived from chemical and organic processes. The geologic past has endowed Missouri with an abundance of limestone that occurs nearly everywhere in the state, exposed at the surface and buried in the subsurface.

The production of limestone contributes about one billion dollars annually to Missouri’s economy. The diverse uses of limestone are more numerous than one may realize and limestone-derived products allow us to maintain a high standard of living.

Used in landscape construction and Portland cement manufacture, limestone is also a critical component in the manufacture of pharmaceutical products, toothpaste, paint, glass, caulking, concrete and pollution-control technologies. Limestone and its derivative products play a crucial role in our daily lives. Farmers use agricultural limestone to neutralize soils acidity.

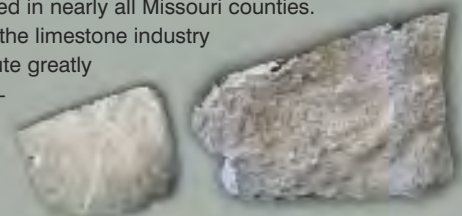
Limestone is long-lasting and stands up well to exposure. This has made limestone popular in architecture and many landmarks. Missouri’s Capitol is made of limestone. Both the exterior and interior of the building, with the exception of the third floor,

are made of Burlington limestone from Carthage. The third floor contains stone from the Phenix Quarry in Greene County.

Also made of limestone are the Tennessee State Supreme Court building in Nashville, the Roman Arena in Verona, Italy, and many other buildings and architectural treasures such as the Great Pyramids of Egypt.

Missouri has had a robust limestone industry that has led to processing the rock into a variety of useful, if not vital, products for Missouri, the nation and the world. Limestone mining and utilization in Missouri began in the mid 1800s. The amount mined prior to 1920 is not known for certain. Since that time, the Division of Geology and Land Survey estimates that 3.1 billion short tons of limestone having a present value of approximately \$18 billion have been mined in Missouri from 1920 to present. Limestone is produced in nearly all Missouri counties.

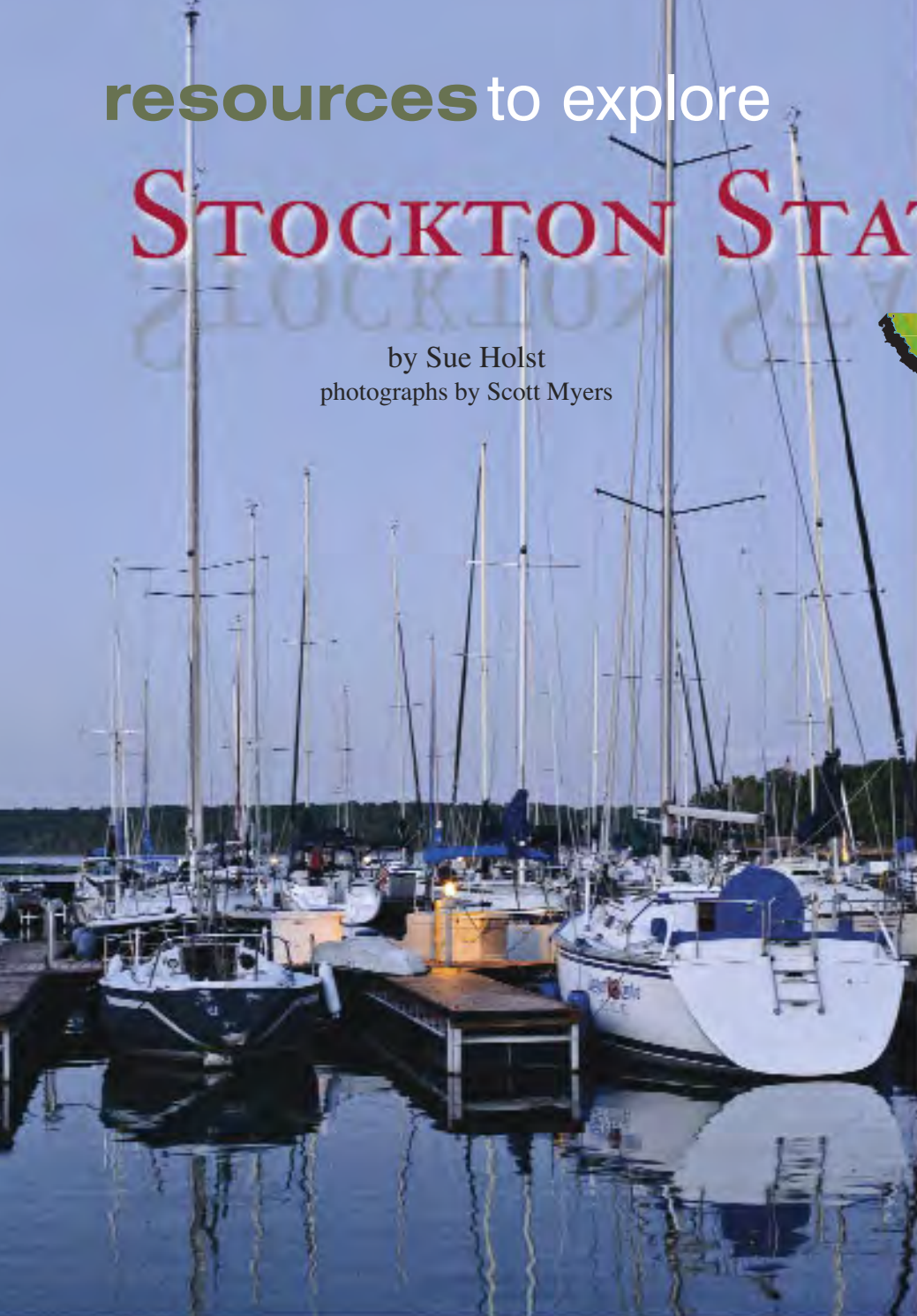
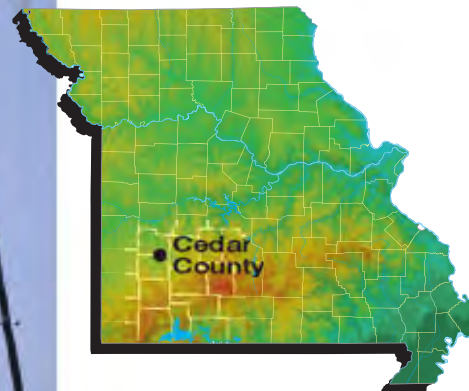
Needless to say, the limestone industry continues to contribute greatly to the economic well-being of Missouri and the quality of life of its citizens.



resources to explore

STOCKTON STATE PARK

by Sue Holst
photographs by Scott Myers



Sailors flock to Stockton Lake for its dependable breeze and reputation as a great lake for sailing.

Clear blue water and a steady breeze make Stockton State Park a favorite for people wanting to enjoy water recreation from sailing and swimming to fishing and boating. Located on a peninsula between the Big and Little Sac arms of Stockton Lake, the park offers easy access to the lake for many activities. The 2,176-acre park also has amenities for those wanting to keep their feet on dry land.

Stockton Lake is best known for its dependable southwest breeze, which has made it one of the most popular sailing lakes in

the Midwest. Would-be sailors or those wanting to learn more about the sport can take advantage of one of the nation's best sailing schools located at the park. The American Sailing Association has named the sailing school at Stockton State Park Marina an Outstanding Sailing School in 2009 and 2010. A sailing school's instructor was selected as one of the top 30 certified active instructors in the world in 2009. Private classes are available for those wanting to learn the best techniques and secrets of this serene sport.

Sailing is not the only kind of boating at Stockton State Park. All types of boaters in everything from family pontoons to personal watercraft come to the park to take advantage of the opportunity for water recreation. The park's marina rents all variations of boats and watercraft, including fishing boats, bass boats, sailboats, pontoons,

Catalinas and WaveRunners. The full-service marina offers everything boaters need, including gas, fishing tackle, bait, clothing, souvenirs, groceries and camping supplies. The marina includes more than 350 boat slips, with more than 100 designated for sailboats. A new breakwater completed in 2010 helps protect the boats from wave damage. The park has two boat ramps that do not charge to launch.

The lake is also known for its clear blue water, a fact that surprised Justin Adams when he became park superintendent in 2011.

"I'm still amazed by how clear the water is," he said.

Adams credits it with one of the reasons the lake is so popular with sailors and all kinds of boaters. Scuba divers also like the lake's clear blue water and swimmers can enjoy the water at the park's designated swimming beach.

"I think the clarity of the water is one thing that sets this lake and park apart from others," Adams said.

The clear water also may be a reason that fishing is so outstanding in the lake. Fishermen flock to the lake for crappie, walleye, bluegill, and channel and flathead catfish. Largemouth, smallmouth, spotted and white bass also are amply taken by anglers. Fisherman can try their luck from a boat in the many coves and points or fish by walking along the shorelines. Fishing licenses can be purchased at the marina store.

Stockton Lake is one of the major reasons for the park's popularity but there is more to the park than water. After a day on the lake, visitors may want to spend the night, and there are several different options to accommodate everyone's taste. The park's main campground has basic campsites for those wanting to spend the night in a tent and campsites with electricity for those who prefer more comforts in a recreational vehicle. The campground offers showers, water, laundry facilities and a

dump station. A number of the campsites are reservable in advance and others are available on a first-come, first-served basis.

Stockton State Park offers two options for campers who want to experience something new. Five walk-in sites provide more solitude for those wanting to be closer to nature while still being located close to the amenities of the campground. An added bonus is great views of the lake from the walk-in sites. The walk-in sites can be accessed through the campground or by a canoe or kayak from the park marina's boat launch area.

Another option you may try is the camper cabins if you want to experience camping with some of the comforts of home. These rustic log cabins offer beds, electricity, heating and air conditioning but do not have water or restrooms. Each cabin has a dining table, ceiling fan, compact refrigerator and microwave/toaster oven on the inside and a picnic table, pedestal grill and campfire grill outside. Tucked away in the campground, the camper cabins provide access to all the amenities of the campground, including the shower houses and fresh water.

"I think the clarity of the water is one thing that sets this lake and park apart from others."

— Justin Adams,
superintendent,
Stockton State Park.



(Above) If you want to learn to sail for the first time, try out the nationally recognized sailing school at Stockton State Park.

(Left) Water so clear you can see the fish sets Stockton Lake apart and makes it fun for all ages.





(Top) For your perfect day of fishing, Stockton State Park offers a marina to rent a boat as well as ramps to launch your own craft. **(Above)** After a day on the water, relax in Stockton State Park's campground and start a new family tradition.

For the times when you may be seeking a more traditional lodging experience, the park offers one-bedroom and two-bedroom duplexes. The one-bedroom duplexes can sleep up to four people and the two-bedroom duplexes can sleep up to six people. All duplexes include a full kitchen, outside grill and picnic table.

If you want to try something other than your freshly caught fish, try the new Snak

Shack at the marina. Accessible from land or the water, you can dine inside or have your meal on the deck viewing the lake. There is a variety of options for lunch and dinner including burgers, chicken strips, salads, grilled chicken sandwiches and much more. Breakfast is available on weekends and holidays.

Stockton State Park is a great place for a picnic and there are two main picnic areas that provide great spots to eat lunch or dinner with views of the lake. Children's playground facilities are located nearby. Two large open picnic shelters are perfect for hosting large family gatherings and other special occasions. The shelters can accommodate up to 100 guests and can be reserved in advance. The North Shelter, which overlooks the lake, includes electrical outlets, water, picnic tables, an outdoor grill, restrooms and children's playground equipment. The South Shelter, near the marina, features picnic tables, an outdoor grill, boat slip access and restrooms.

If you want to explore even more of the park and get some exercise, try the one-half-mile Nyblad Trail. Following the shoreline of the Little Sac arm of Stockton Lake, this trail traverses secondary forests of elm, hickory and oaks with views of Stockton Lake. In the spring, watch for blooming redbud and dogwood trees. You also might spot birds that take advantage of the lake's shoreline such as great blue heron, barred owls, ospreys and eagles.

If you are interested in a longer hike, the Umber Ridge Trail, completed with the help of the State Parks Youth Corps in 2010, offers a 1.5-mile hike. This trail, accessed from the trailhead located on the beach road near the North Shelter, has a natural surface that is easy to hike. The trail begins on the western side of the peninsula, offering vistas of Stockton Lake. After taking you near the beach, the trail turns south and traverses the eastern slope of the peninsula through open white oak woodlands.

Stockton State Park is located on Highway 215 south of Stockton in Cedar County. For more information, call the park at 417-276-4259 or visit mostateparks.com. For information on the marina and to make camper cabin and duplex reservations, call 417-276-5329.

Sue Holst is the information officer for Missouri State Parks.



Justin Davis

The Magic of Minerals

From cell phones to AEDs,
rocks help power our daily lives

by Hylan Beydler

photographs by Scott Myers

Anyone who has played the game “Twenty Questions” knows if the answer is not a plant or animal, it is a mineral. If it involves technology for communications, entertainment or work, the likely answer is mineral. The traditional game requires inductive reasoning in which one player is chosen to be the answerer. That person chooses an object, allowing the other players to ask 20 questions in order to determine what it is.

Justin Davis is one such answer provider for the Missouri Department of Natural Resources. An industrial minerals geologist with the department’s Geological Survey Program, Geology and Land Survey Division in Rolla, Davis recently marked his third year with the agency.

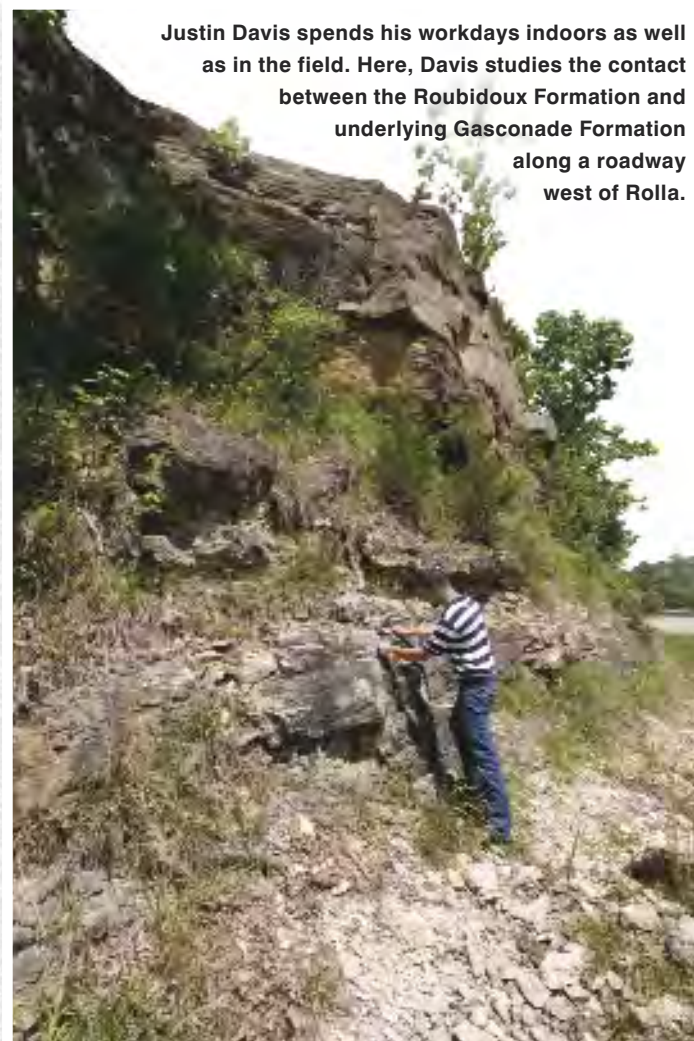
Davis’s primary role is to understand the geology and mineral deposits in the state.

“When the geological survey was established in 1853, its mission was to provide information on Missouri’s natural resources to help boost the state’s economy, and I am honored to be able to serve in this capacity,” said Davis.

Mineral commodities Davis specializes in include: limestone, sand, gravel, sandstone, barite, clay, shale and granite.

Mineral resources help support our nation’s supply chain and enable industries to bring to market products that contribute to society and economic stability. Everyday items like cell phones, laptops, cars, buildings, lifesaving medical devices and equipment used in national defense systems contain minerals.

Davis’s program director, Jerry Prewett, said, “Professional geologists like Justin analyze information about the state’s geologic resource potential. The unique tools Justin received through education in the geologic



Justin Davis spends his workdays indoors as well as in the field. Here, Davis studies the contact between the Roubidoux Formation and underlying Gasconade Formation along a roadway west of Rolla.

sciences have been important in developing his professional career.”

It only seemed right to Davis to join ranks with Prewett. After all, while in junior high, Davis job-shadowed Prewett.

“One early advocate told me since I liked geology, there would always be an aspect of the profession I would enjoy,” said Davis.



(Above) Geologists like Davis can read rock core like pages of a book. He examines the core to determine rock type, mineral presence, engineering characteristics and other key features. (Right) Nearly 500 miles of exploration rock core reside at the department's McCracken Rock Core Library and Research Center. Rock core yields data useful in solving environmental, industrial and engineering problems. Located in Rolla, the center is one of the largest rock core collections in the nation and is open to the public by appointment.

“As I moved along, there was always another mentor who supported and guided me – for which I am thankful.”

Like the Twenty Questions game player, Davis employs inductive reasoning that requires numerous skill sets. “My average field day is spent examining outcrops, cross sections of rocks and geologic maps for reference in order to put together a 3-dimensional picture in my mind of what resides in nature.” He may later employ the use of geographic information systems to assimilate structural geology and faults in order to properly portray the area.

Following a presentation given by Davis at a meeting of the Missouri Limestone Producers Association, a sand and gravel company owner asked for assistance in identifying potential resources.

Davis employed aerial photographs, geologic maps and a variety of other data to create a region-specific map. Locations of wells and information about rock core and well-cutting samples from the department's McCracken Rock Core Library and Research Center, located in Rolla, also were used.

Davis also retrieved sand and gravel resource publications from the division's extensive library before the businessman came to Rolla to meet with him. Thanks to his expertise and experience, Davis was able to assist the business owner with important decision-making information.

One who appreciates rocks, enjoys various tasks, communicates and listens well, enjoys spending time in the woods, wading streams, and at the same time, has computer skills and can explain what they have seen may want to consider a career in geology.

Chemistry and statistics classes also have proven to be extremely important to Davis who earned a bachelor's degree in geology in 2005 from Missouri University of Science and Technology, Rolla. Prior to state employment, Davis was a student hydrologist with the U.S. Geological Survey, Missouri Water Science Center in Rolla, where he collected and analyzed hydrologic data. He presently is pursuing a master's degree in geology at MS&T.

Visit dnr.mo.gov for information about Missouri geology and for information about other career opportunities, visit the Office of Administration's website: oa.mo.gov/pers/.

Hylan Beydler is division information officer for the department's Division of Geology and Land Survey.



New Madrid Bicentennial

by Hylan Beydler

Two hundred years ago, Missouri experienced powerful earthquakes in the Bootheel region of the state. A series of three to five major earthquakes (estimated magnitude 7.0 or larger) occurred in the New Madrid Seismic Zone (NMSZ) in the two-month period between Dec. 16, 1811 and Feb. 7, 1812. Several thousand additional, smaller temblors occurred during the three-month period from Dec. 16, 1811 to March 16, 1812. Although the death toll has never been tabulated, according to the U.S. Geological Survey, loss of life in the sparsely populated Bootheel area was slight.

The NMSZ, named for the small Missouri town of New Madrid, is located in southeastern Missouri, northeastern Arkansas, western Tennessee, western Kentucky and southern Illinois. Portions of Indiana, Mississippi and Alabama also receive significant shaking from large earthquakes occurring in the NMSZ.

The zone is the most active seismic area in the United States east of the Rocky Mountains. Small earthquakes occur in the region daily. While earthquakes along the fault do not typically cause damage, they are a natural hazard that no one can predict. About 200 years separated Haiti from its last major quake. It has been nearly 200 years since the 1811-1812 earthquakes in the New Madrid area. In the

past 25 years, scientists have learned that strong earthquakes in the central Mississippi Valley are not unique events but have occurred repeatedly in the geologic past.

Large earthquakes occurring today in areas nearest the NMSZ could cause widespread and catastrophic physical damage, negative social impacts and economic losses. Whether one lives in the region or in other locations of the state, there are things everyone can do to be better prepared. These include simple things such as securing water heaters and tall furniture and having an emergency plan.



Henry Howe, *Historical Collections of the Great West*, 1851.

To further our knowledge of earthquakes and risks associated with ground shaking, geologists with the Department of Natural Resources' Division of Geology and Land Survey provide scientific data about the New Madrid Seismic Zone, geologic mapping, seismic wave velocity data and other geologic information about the basics of earthquakes.

In addition to awareness programs, department geologists are actively conducting hazards mapping projects to better understand impacts from seismic events such as ground collapse, soil liquefaction, landslides and flooding.

In the event of a damaging earthquake, the division will activate the Post Earthquake Technical Information Clearinghouse. The PETIC will serve as a clearinghouse to coordinate research activities and to facilitate collaboration between the emergency

management and research communities following a large, damaging earthquake in the region. The PETIC will be located at the department's Division of Geology and Land Survey, 111 Fairgrounds Road, Rolla.

For more information about earthquake hazards and preparedness, visit: dnr.mo.gov/geology. Information about bicentennial events is online at the New Madrid Bicentennial website: newmadrid2011.org/.

Hylan Beydler is division information officer for the department's Division of Geology and Land Survey.

MISSOURI DEPARTMENT
OF NATURAL RESOURCES
PO Box 176
Jefferson City, MO 65102-0176

Nonprofit Org.
US POSTAGE PAID
MO Dept. of
Natural
Resources

